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A Critical Review of "Systematische Untersuchungen am *Pieris napi-bryoniae*-Komplex (s.l.)" (Lepidoptera: Pieridae) by Ulf Eitschberger

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Abstract. An extensive publication claiming to contain a taxonomic revision of the *Pieris napi* species-group is reviewed and analyzed. The results of the publication are largely rejected, and the taxonomic and nomenclatorial status of some taxa named therein revised. First steps are taken to protect unchanged continued use of some well established species-group names. Although a large amount of data are presented in this work, and the effort is enthusiastic and superficially impressive, there is no cohesive view of what *Pieris napi* represents, nor is the data base of any practical value.

Introduction

Bibliographical reference to the publication discussed in this paper: Eitschberger, U., 1984. Systematische Untersuchungen am *Pieris napi-bryoniae*-Komplex (s.l.) - Herbipoliana 1(1983)(1):I-XXII, 1-504; (2):1-601. - DM 360.--, published in 1000 numbered copies.

Although taxonomic revisions are extremely valuable in describing the systematic diversity of the living world, in making the information accessible to the audience interested, such works are few and far between. This work is not only without value, it is irresponsible. Its tragedy lies in the great deal of unrefereed effort and the resources which were squandered. In the following we will describe the shortcomings to justify its rejection.

The work was published in two parts which appeared jointly. The publication date stated is 1983, by implication the 31st of December. Nonetheless, the book was not distributed until February 1984, which gives us reason to believe that this is also the true date of publication according to the International Code of Zoological Nomenclature (ICZN)

Article 21 and 22. In consulting the relevant copyright library (i.e. Deutsche Bibliothek in Frankfort a.M.) we have been advised that the publishers complied with their obligation on 13 August 1984.

Part 1 consists of foreword by E. Reissinger followed by the complete text of the work. This consists of a general section of 26 pages dealing with elementary accounts of the morphology, eggs, larvae, pupae, etc., of the *Pieris napi* species-group, followed by all the species monographs. The whole work is written in an easy-going, narrative style as small talk between butterfly collectors. Part 1 concludes with a partial bibliography of *Pieris napi* species-group and an assortment of black-and-white portraits of some students of the genus *Pieris*.

Part 2 consists solely of plates. It is introduced by a list of explanations, corrections and apologies, which is strange considering the high price of the publication. In order, there are some 100 plates of line drawings of androconia and some 140 plates of line drawings of male genitalia and their parts, poorly executed and numbered in handwriting. Twelve plates are devoted to female genitalia, drawn to the same standards. Another 12 plates are photographs of male and female genitalia, all more or less out of focus and dissected so badly that it is difficult to distinguish between anatomical structures and debris of unremoved tissue. Further 15 plates contain simple line drawings of "standardized" legs, pupae, etc. and 18 plates of good stereoscan photos of various anatomic structures of adults and early stages. The main part of this volume is comprised of nearly 100 color plates illustrating adults; the last 11 plates are devoted to an assortment depicting some eggs, larvae, biotopes and Professor Lorkovic.

At first glance the color plates of adults butterflies are impressive, on closer scrutiny they are disappointing:

- The specimens are not figured to the same scale, with the upperside normally figured at a different magnification than the underside of the same specimen (cf. e.g. holotype of *Pieris napi carlosi*: pl. 401, figs. 29 and 30). This is admitted in a casual reference (cf. pt. 2, p. 3).
- In the preparation of plates, all antenae were removed and later crudely drawn in. Such perfunctory work produced at least one amusing "lapsus calami": plate 439, fig. 27 shows a specimen with three antennae of which two are "artificial" and the remnant of the third is real.
- Some specimens appear to be fakes: the specimen referred to as both a holotype (cf. pt. 2, p. 402) and a lectotype (cf. pt. 1, p. 109) designated by Eitschberger, is said to be identical with the specimen figured by Verity (1905-1911) on plate XXXII, fig. 4 of his "Rhopalocera palearctica". A simple comparison of both illustrations reveals considerable discrepancy, suggesting at the least unbelievable sloppiness.
- There is no indication whatsoever concerning the scale of magnification of the illustrations on color plates 579-599.

It is, therefore, safe to conclude that the illustrations in their vast

majority serve no useful purpose.

The systematic part of the work is arranged in a most unconventional way for a taxonomic work. All species group taxa are arranged in groups according to their distribution area, within which they are classified to species and subspecies. This arrangement is confusing. Bearing in mind the impressive 504 pages of text, it is worth listing the proportional composition of the work:

- About 100 pages are devoted to simple lists of examined material, by collection, specimen, locality.
- About 50 pages are devoted to listing the microscope slides made and examined.
- About 50 pages are reproductions of original descriptions and previously published material.
- About 25 pages are reproductions of distribution maps published elsewhere by other authors.

All in all, some 225 pages contain information which was redundant.

With reference to the unusual title of the publication: "Systematic investigations of the *Pieris napi-bryoniae*-komplex (s.l.)", we wonder if the author is unaware that:

- There is a decisive difference between the terms "systematic investigations" and "investigations of the systematics"?
- The use of hyphen in zoological nomenclature is determined by Art. 32(c) of the ICZN and limited to a few special cases?
- What he calls "Komplex (s.l.)" is generally known as the *Pieris napi* species-group?
- The name of the nomenclatorially oldest species, i.e. *Pieris napi* is adequate to denote every species-group, and the inclusion of the name *bryoniae* is unnecessary and confusing?

What is hidden behind such a long and complicated title can be found in the summary (pt. 1, p. 471): The work is a taxonomic revision. Consequently, it must be judged as such, whereby it is necessary to check whether it fulfills at least some requirements of that specialized form of scientific communication.

Taxonomic revisions are scientific works presenting both new material and including all hitherto known material relevant to the topic, where necessary reevaluated and newly interpreted, including the application of new methodology. Although taxonomic revisions vary greatly in scope from basic (essentially a taxonomic synopsis) to monographic, revisions must include the following features:

- definition and taxonomic position of the group under revision,
- taxonomic history of the group,
- key (or equivalent identification aid) to all taxa recognized,
- original combinations of and bibliographical references to all treated

taxa stated,
- full synonymy of all taxa recognized,
- index to all names presented,
- rationalized redescription of all recognized taxa,
- diagnostic features of all recognized taxa, and
- statements presenting clearly and logically all reasons for the actions taken therein.

A communication that fails to fulfill most of the above features is certain to fall short of fulfilling the chief aim of the revision: to make the taxonomic group accessible to all zoologists and biologists beyond the very narrow circle of specialists well acquainted with its taxa. This work fails to fulfill even one of these points.

Comments on Terminology and Methodology

One of the striking features of the book is the author's inadequate vocabulary characterized by the lack of even the most basic terms, their misinterpretation and misapplication. This is documented by his description of an androconium (cf. pt. 1, p. 20; here translated from German): "Androconia [sic] look like a short-legged fat-bellied man [sic] whose head and neck have ingrown transitionlessly together. The head is covered by hair-fringes that can differ in length from specimen to specimen within a single species." (Eitschberger's description continues, but the sample translated here is considered adequate for the purpose). Androconia have no hair (or what are here called "hair-fringes"), but terminate in minute points; the "head and neck ingrown transitionlessly together" is generally known as lamina, and so on. Further on, he rejects the established term "androconium of the primitive type" and replaces it with cumbersome double-word "Makro- oder Riesen-Androkonium" (cf. pt. 1, p. 22). As the reason for the change, the author states that he does not follow the conventional term because he does not like it. It also appears that such well known terms as phallus and phallobase are totally unfamiliar, as he uses (cf. pt. 1, p. 29) aedoeagus instead of phallus, prefers to utilize "Rohr" (i.e. tube) instead of aedoeagus, and "Aussackung" instead of phallobase.

In addition to the strange morphological terminology, there are misused and confused taxonomic terms, of which some of the more important must be discussed here because their understanding is essential to decipher many confused statements:
- Eitschberger does not appear to know that 'nomen nudum' applies to a name that, if published before 1931, fails to satisfy the conditions of Articles 12 and 16, or, if published after 1930, additionally fails to satisfy the provision of Article 13(a) of the ICZN.
- He is unaware of the meaning, if not the existence, of the terms 'avail-

able name', 'unavailable name', 'valid name', 'invalid name' and 'infrasubspecific name'; or that they are defined by the ICZN. In particular, he does not seem to realize, that a name, to become available, must satisfy the provisions of Chapter IV of the ICZN, and that infrasubspecific names are defined by Articles 1 and 45(d) of the ICZN.

- He applies the definitive term 'nomen nudum' at random and uses his own creation "indirect nomen nudum" (cf. pt. 1, p. 188) for names that he believes to be unavailable and/or infrasubspecific in a conventional meaning.
- He does not appear to understand the difference between a binomen (which indicates in the trinominal system of names a monotypic species) and a trinomen (which indicates a polytypic species, in particular its nominate subspecies, by the repetition of the species-name as the third component of the combination) and denotes both polytypic and monotypic species with trinominal combinations.
- He appears unaware that 'comb.n.' indicates that a species-group name is being transferred to a genus different from that included in the original combination; that 'stat.n.' indicates a change of rank within the species-group is taking place, including a transfer of a subspecies-rank name to another species; that 'nom.n.' indicates that a new name is proposed to replace an existing name. Consequently, he uses the first two abbreviations at random as a meaningless appendix to some combinations, and the last abbreviation he places behind newly proposed infrasubspecific names.
- He lastly appears totally unfamiliar with the type-concept, in particular with the conditions regarding the designation and status of holotypes and lectotypes, and the purpose and conditions for the designation of neotypes. There is also an apparent unawareness that the loss of type(s) does not affect the nomenclatorial status of names.

Although the author refers frequently to the ICZN, which he calls "Nomenklaturregeln", and even volunteers advice to the International Commission on Zoological Nomenclature as to the treatment of what he calls "direct and indirect nomina nuda" (cf. pt. 1, p. 188), there appears to be a gap in understanding the Code. In no other way could this work have been produced.

A lack of general zoological knowledge is also apparent from repeated misspellings of commonly used terms, such as "Cariologie" instead of Karyologie, "Lectoparatypus" instead of Paralectotypus, "Heterozygote" instead of hybrid, etc.

The designation of figures as lectotypes, in disregard of Article 74(a)(ii) and 74(b) of the ICZN, must be mentioned (cf. comments on certain taxa treated in the work and pt. 1, p. 471: confusion between examined types and figures of types). Some insight into the approach to zoological

research is the fact that the author keeps type-material in his private collection instead of recognized depositories.

Valuable space in the publication is devoted to personal attacks on other students. One of the most severely attacked lepidopterists is the late B.C.S. Warren. The following example is characteristic, as well as amusing and amazing at the same time. Warren (1961) referred certain American populations to *Pieris bryoniae pseudobryoniae* Verity, although already aware of the unavailability of the name, because its original combination was *Pieris napi frigida pseudobryoniae* Verity, 1908 (Kudrna, 1983). The name *pseudobryoniae* had been widely used by various authors and raised to the rank of subspecies as *pseudobryoniae* auct. Warren's (1961) decision was taxonomically correct and justified because he was unable to establish unequivocally both the author and date of ssp. *pseudobryoniae* auct.—a task for the future reviser. Twenty years later, Eitschberger (1981) named a monotypic species *Pieris angelika angelika* [sic], denoted it by a trinomen but without a description, so that the name is a clear nomen nudum. In this publication, Warren (1961) is accused of misidentifying *Pieris angelika angelika* Eitschberger, 1981, calling it *pseudobryoniae* instead.

Eitschberger's approach to the study of *Pieris napi* species-group is in principle very simple, defining one purpose (cf. pt. 1, p. 2) to demonstrate that *Pieris napi* and *P. bryoniae* are two distinct species—but not to investigate their relationship. To achieve this goal, extensive use of selected data is effected, as evident by the treatment of the Fennoscandian taxa *napi, adalwinda* and *bicolorata*. Although fully aware of publications which have shown the close relationship between these taxa, including interbreeding both in nature and in the laboratory as well as morphological affinities (e.g. Peterson, 1949), he states that the latter two are subspecies of *bryoniae* (without stating the factual evidence to support such treatment). He substantially misinterprets statements made by other authors:

- For example it is claimed that Stephen & Cheldelin (1973) investigated 21 [sic] species of Hymenoptera [sic] and found no differences of Isoenzyme patterns, a statement to argue against the use of electrophoretic methods in taxonomy. In fact, Stephen & Cheldelin (1973) studied 21 *Bombus* spp. and four *Psythyrus* spp. clearly finding four distinctive patterns: three in *Bombus* spp. and one in *Psythyrus* spp.
- To further his argument against electrophoretic methods (cf. pt. 1, p. 35), he accuses Geiger (1981) of having concealed that deep-freezing of material can affect the results; in fact Geiger (1981:185) checked and discussed such effects.

Some essential publications on the genus, including Klots (1933) and Bernardi (1947) were omitted.

Comments on Newly erected Taxa and their Nomenclature

A remarkably high number of new taxa were created in this work: three new species, 21 new subspecies and 34 new infrasubspecific "seasonal forms". Two species-group taxa named earlier by the author (Eitschberger, 1981; Eitschberger & Hesselbarth, 1977) are also relevant to this discussion.

The names of infrasubspecific taxa were proposed "uninominally", but the original combination is unmistakeably implied from the specific or subspecific heading. Most of seasonal forms are not accompanied by any description or definition. Nevertheless, this is irrelevant because the names are unavailable according to the ICZN. We list the infrasubspecific taxa chronologically, with all original combinations reconstructed from implications given in the text. All monotypic species are listed here in binominal combinations regardless of Eitschberger's usual use of a trinomen; number in parenthesis following the name indicates the relevant page of original designation in part 1, where—contrary to the ICZN—these taxa are generally marked "nom.n."

Pieris napi napi postnapae (p.43)
Pieris napi migueli antemigueli (p. 95)
Pieris napi santateresae antesantateresae (p. 99)
Pieris napi carlosi antecarlosi (p. 104)
Pieris napi lusitanica antelusitanica (p.105)
Pieris napi britannica postbritannica (p. 109)
Pieris napi meridionalis antemeridionalis (p.114)
Pieris napi muchei postmuchei (p. 135)
Pieris bryoniae flavescens anteflavescens (p. 151)
Pieris bryoniae wolfsbergeri postwolfsbergeri (p. 156)
Pieris bryoniae lorkovici postlorkovici (p. 161)
Pieris bryoniae marani postmarani (p. 170)
Pieris bryoniae vihorlatensis postvihorlatensis (p. 173)
Pieris bryoniae carpathensis postcarpathensis (p. 174)
Pieris bryoniae bicolorata postbicolorata (p. 179)
Pieris pseudorapae pseudorapae postpseudorapae (p. 187)
Pieris pseudorapae suffusa postsuffusa (p. 191)
Pieris pseudorapae balcana postbalcana (p. 202)
Pieris persis antepersis (p. 215)
Pieris dulcinea pseudonapi antepseudonapi (p. 241)
Pieris dulcinea saghalensis antesaghalensis (p. 246)
Pieris oleracea oleracea postoleracea (p. 263)
Pieris marginalis reicheli postreicheli (p. 301)
Pieris marginalis pallidissima antepallidissima (p. 306)
Pieris marginalis macdunnoughi postmacdunnoughi (p. 309)
Pieris marginalis mogollon postmogollon (p. 314)
Pieris marginalis guppyi postguppyi (p. 324)

Pieris acadica anteacadica (p. 336)
Pieris erutae reissingeri antereissingeri (p. 374)
Pieris erutae latouchei postlatouchei (p. 376)
Pieris erutae kneitzi antekneitzi (p. 378)
Pieris steinigeri antesteinigeri (p. 382)
Pieris extensa bhutya antebhutya (p. 387)
Pieris melaina postmelaina (p. 406)

We are aware that some of the infrasubspecific taxa named by Eitschberger already had names, proposed by other authors, and that the formation of their names does not necessarily follow the recommendations of the Code: Appendix D, etc. It is interesting to note, however, that he (cf. pt. 1, p. 170), considered the taxonomic status of *Pieris bryoniae vihorlatensis* Moucha, 1956, doubtful and suggested that it could be identical with *Pieris bryoniae marani* Moucha, 1956, yet further on he named a new infrasubspecific seasonal form of the taxon previously not considered worthy of recognition (pt. 1, p. 173) calling it *postvihorlatensis*. No consequent action was taken following the suspicion of *vihorlatensis* and *marani* being identical.

According to ICZN, all species-group names published after 1930 must in addition to the provisions of Articles 12 and 16 satisfy also those of Article 13(a); these stipulate that an author must provide a statement that purports to give characters differentiating the taxon. Eitschberger's names usually fail to comply with the provisions of Article 13(a), but on a few occasions, a casual reference given to other related taxa might just save some of his names, if the provisions of Article 13(a) are leniently applied. We list below names proposed for species and subspecies, according to rank, in chronological order—monotypic species are denoted here by a binomen even if Eitschberger originally used a trinomen—which, failing to comply with the provision of Article 13(a), must be treated as nomina nuda. The number in parenthesis refers to the page of original designation (in part 1):

Pieris bowdeni (p. 218) nomen nudum
Pieris napi migueli (p. 94) nomen nudum
Pieris napi santateresae (p. 99) nomen nudum
Pieris napi carlosi (p. 103) nomen nudum
Pieris bryoniae schintelmeisteri (p. 129) nomen nudum
Pieris napi muchei (p. 135) nomen nudum
Pieris marginalis tremblay (p. 327) nomen nudum
Pieris marginalis shapiroi (p. 330) nomen nudum
Pieris marginalis browni (p. 332) nomen nudum
Pieris virginensis hyatti (p. 358) nomen nudum
Pieris erutae reissingeri (p. 374) nomen nudum
Pieris erutae kneitzi (p. 380) nomen nudum

We wish to note here, that an earlier named taxon, *Pieris bryoniae tur-*

cica Eitschberger & Hesselbarth, 1977, is nomen nudum owing to the authors' failure to comply with the provision of Article 13(a) of the Code and that this name was not made available in the present work. Also *Pieris angelika* Eitschberger, 1981, was nomen nudum since the name was published without description, definition or valid indication, but this name was made available in the present work.

The following names satisfy the provisions of Article 13(a) usually only because of casual hints included in the description or discussion. These are, therefore, available:

Pieris angelika [nec Eitschberger, 1981] (p. 340): see above.

Pieris steinigeri (p. 382)

Pieris napi kaszabi (p. 137)

Pieris bryoniae wolfsbergeri (p. 154) is available only if a casual reference to the following taxon described subsequently in the same work is accepted as a satisfactory statement purporting to distinguish the taxon (cf. *P. bryoniae lorkovici*, below).

Pieris bryoniae lorkovici (p. 161) is available only if the preceding name is accepted as available. It seems that only some specimens of the two taxa can be separated; some populations are not clearly referable to either taxon (cf. taxonomic comments below).

Pieris bryoniae sheljuzhkoi (p. 128)

Pieris ochsenheimeri gerhardi (p. 228)

Pieris oleracea ekisi (p. 272)

Pieris marginalis reicheli (p. 301)

Pieris marginalis meckyae (p. 322)

Pieris marginalis guppyi (p. 324)

Pieris erutae werneri (p. 380)

Comments on Some Taxa Recognized

This work introduces numerous taxonomic and nomenclatural changes based upon complete intuition. We consider it necessary to discuss the taxonomic status of those taxa, where possible, without another taxonomic revision. For this purpose we retain tentatively a conventional trinominal system of categories (genus, species, subspecies), although we personally are not entirely convinced of the usefulness of the subspecies concept. Thus, the tentative retention of the "subspecies" enables us to better relate some of Eitschberger's taxa. We have excluded all his nomina nuda and with a few exceptions have concentrated on the European taxa. For the same reason, and against our better judgment, we treat here *Pieris napi* and *P. bryoniae* as two polytypic species. We consider that *Artogeia* Verity, 1947, as defined by Kudrna (1974), is a reasonable subgenus of the genus *Pieris* Schrank, 1801, as defined by Klots (1933). Although Kudrna's (1974) elevation of *Artogeia* to generic level was in

accordance with the trend of splitting genera at the time, it must now be seen as an error, as later corrected by the same author (Blab & Kudrna, 1982).

Pieris napi napi maura Verity, 1911 (pt. 1, p. 84) is an unavailable infrasubspecific name proposed for a race, the original combination and rank of which is misinterpreted. The correct name for the taxon should be *Pieris maura* Warren, 1970. Eitschberger's designation of a lectotype is invalid because the lectotype was already designated by Warren (1970) from the original type-series, and can be implied for the species-group taxon. However, Müller & Kautz (1939) elevated Holl's taxon as *Pieris napi blidana* to the rank of subspecies. Should their *blidana* prove to be subjectively identical with *maura, blidana* would have priority.

According to Article 32(c)(i) of the Code, names published hyphenated (except for certain specific cases) must be corrected by the deletion of the hyphen. Eitschberger (p. 87) failed to correct the hyphenated name *Pieris napi-napaeae-atlantis* Oberthür, 1924, to *P. napinapaeaeatlantis* or, which would be more reasonable, to apply to the International Commission on Zoological Nomenclature to use its plenary powers and rule otherwise. Warren (1970) called the taxon *Pieris atlantica* Rothschild, 1917. Specimens called holotype and allotype by Eitschberger are in fact syntypes, as Oberthür made no specific designation.

Both the taxonomic and nomenclatural status of *Pieris napi lusitanica* Sousa, 1929 (or 1926?) (p. 105) is questionable and would be best treated as "nomen dubium". The designation of a neotype of *lusitanica* herein is invalid because (1) the author failed to assure that the type-material of *lusitanica* is lost, and (2) that the specimen which served for the figure [sic] designated the neotype exists and its depository satisfies Article 75 of the ICZN.

Pieris napi napi britannica Verity, 1911 (p. 109) is an unavailable infrasubspecific name. The taxon was treated as a subspecies by Müller & Kautz (1939) who should take the authorship of the subspecies *britannica*. The specimen designated by Eitschberger as a lectotype (pt. 1, p. 109) is referred to as a holotype (pt. 2, p. 402 and pl. 403, figs. 15 and 16) and said to be identical with the specimen figured by Verity (pl. XXXII, fig. 4). A simple comparison of the figures shows that the specimens cannot be identical. Because Verity (1905-11) designated no paratypes, the specimens figured (pt. 2, p. 402, pl. 403, figs. 17-22) and called paratypes cannot possibly have that status.

The authorship of *Pieris napi meridionalis* Heyne, 1895, (p. 114) is long-established (Hemming, 1931); the discussion and erroneous conclusions are totally unnecessary.

The designation of a neotype of *Pieris bryoniae kamtschadalis* Röber, 1907, (p. 126) is invalid because the author failed to ascertain whether the provisions of Article 75 of the Code were fulfilled. It is an open question whether *kamtschadalis* is a subspecies of *bryoniae*. The author's treatment of *kamtschadalis* as a subspecies, originally ranked as a form is correct, but contradicts his treatment of *dubiosa* named by the same author and also designated a form.

The authorship of *Pieris bryoniae* is attributed to Hübner, 1791, (p. 140) who apparently proposed the name uniominally; it is possible that the year 1791 is an error for 1793. According to Kocak (1981) the valid name for the taxon is *Pieris bryoniae* (Hübner, 1806), and *Papilio bryoniae* Hübner, 1793, was placed on the

Index of Rejected Specific Names in Zoology. The notes concerning the supposed type of *bryoniae* must then be seen as irrelevant.

Although we cannot volunteer any statements regarding the taxonomic status of *Pieris bryoniae bryonides* Sheljezhko, 1910, (p. 122, 124) the designation of a neotype is invalid as it was not ascertained if the provisions of Article 75 of the Code were fulfilled.

The designation of a lectotype of *Pieris napi flavescens* Müller, 1933, (p. 151) is invalid because the specimen selected could not form a part of the type-material (syntypes by implication) as it is dated 22 VI 1936.

Pieris bryoniae neobryoniae Müller, 1933 appears to be the valid name for the taxon named *Pieris bryoniae wolfsbergeri* Eitschberger, 1984 (p. 154). The author believed that the name *neobryoniae* was unavailable and overlooked its subsequent elevation to the rank of subspecies. His statements concerning the ICZN made in connection with his naming *wolfsbergeri* are false; he was either unaware of Article 10(b) of the Code or else misinterpreted the facts.

Pieris bryoniae lorkovici Eitschberger, 1984 (p. 161) is surely not worthy of recognition as distinct subspecies (cf. differentiation of *wolfsbergeri* and the preceeding note) and should be treated as a junior subjective synonym of *Pieris bryoniae flavescens* Müller, 1933.

The treatment of *adalwinda* and *bicolorata* (p. 175, 179) as subspecies of *Pieris bryoniae* is not supported by any facts: it is simply stated that this is so and no evidence contradicting the statement is given.

So far as we know, *Pieris napi bryoniae caucasica* Verity, 1908 (p. 184) was elevated to subspecies-rank not later than Müller & Kautz (1939); the authorship of ssp. *caucasica* cannot, therefore, possibly go to "Lorkovic, 1968".

There is no stated logical reason for the treatment of *Pieris balcana* Lorkovic, 1970 [nec 1968, according to Z. Lorkovic's pers. comm.] (p. 202) as subspecies of *Pieris pseudorapae* and we propose to reinstate the taxon to its original rank. We are astonished that the holotype of *balcana* found its way to Eitschberger's private collection (original depository: Coll. Lorkovic, University of Zagreb).

Pieris dubiosa Röber, 1907 (p. 187) is the valid name for the taxon herein called *P. pseudorapae* Verity, 1908. The name *pseudorapae* was proposed by Verity (1905-11) uninominally and ranked "var.". The implied combination is not unequivocal and the name can either be interpreted as subspecific or infrasubspecific; later Verity (1911) treated *pseudorapae* as infrasubspecific race *Pieris napi napi pseudorapae* (Kudrna, 1983). However, the name *dubiosa* has clear priority and its original rank must be interpreted as subspecific according to Article 45 of the Code. Following the valid designation of the neotype of *dubiosa* by Riley and Bowden (1969), it being identical with the lectotype of *pseudorapae* selected by Bowden & Riley (1967), the latter name becomes a junior objective synonym of *dubiosa*.

Pieris napi ochsenheimeri narina Verity, 1908 (or *Pieris napi bryoniae narina* Verity, 1908) is an unavailable infrasubspecific name proposed in quadrinominal combination for a race (p. 221). The name was elevated to the species-rank not later than by Warren (1961) who probably takes authorship.

Pieris melete melete pseudonapi Verity, 1911 (p. 241) is an unavailable infrasubspecific name proposed for race. We are not sure who first raised the taxon to the subspecies-rank, but it was not Verity.

Pieris angelika Eitschberger, 1984 (nec 1981: nomen nudum) (p. 340) was pro-

posed because the author believed that *Pieris napi pseudobryoniae* auct. (nec Verity, 1908) and *Pieris napi arctica* auct. (nec Vertiy, 1908) were both nomina nuda. The reasons for this judgment are an insoluable mystery. Nevertheless, the name *pseudobryoniae* was originally proposed as an unavailable infrasubspecific name for the race *Pieris napi frigida pseudobryoniae* Verity, 1908, and was probably raised to the rank of subspecies not later than by Warren (1961). We know that *Pieris bryoniae pseudobryoniae* (sensu) Warren, 1961, is identical with *angelika* (cf. Eitschberger 1984, pt. 1, p. 21) and has priority over the latter name.

For reasons not stated, *Pieris ergane* Geyer, 1828, a species morphologically closely related to the *P. napi* species-group, is not included in the work under review.

Further corrections of the publication under review would require the undertaking of a proper taxonomic revision of *Pieris napi* species-group, a task far beyond the scope of this paper.

Comments on the Taxonomy of *Pieris napi* Species-group

Pieris napi species-group includes a number of taxa which appear to be actively evolving and shifting adapted modes. Thus distinct biological properties are not always accompanied by the presence of constant and categorical taxonomic characters.

Taxonomic revisions based solely on morphological features are useful in those groups where morphological and biological criteria for the recognition of species are concordant. This is certainly not the case with all "semispecies" of the "superspecies" *Pieris napi* or even the whole *Pieris napi* species-group. Here current active speciation makes the delimitation of sharply defined taxonomic units impossible. This cannot surprise anyone who understands the adaptive processes in animal populations. In such cases morphological features can be utilized primarily for identification using a simple binomen with a clarificatory note concerning the known relationship of the taxon. The approach is more useful than a plethora of speculative trinominal combinations based on intuition and disregard of experimental data. Most reasons making the classification of taxa of the *Pieris napi* species-group difficult were known and explained better 50 years ago (Müller, 1933), than by this work.

The *P. napi* species group has been the object of several biological studies of genetic relationship, including the work of Bowden (1979), Petersen (1949), Lorkovic (1962), and others. In Europe, at least, the group can be described as having complex character shifts of both major and minor gene frequencies for wing pattern and voltinism, all further confused by polyphenism. Additionally, most members are partially interfertile **such that** a mosaic of forms occur. Therefore, it is not surprising that in many cases the identification of any given specimen as belonging to one or another subspecies is speculative and decided either by chance or mysticism. Eitschberger does accept the occurance of inter-

mediate specimens (hybrids), which he prefers to call "heterozygotes", apparently believing the two terms are synonymous, and even goes so far as to describe a certain specimen as "slightly heterozygote" (cf. pt. 1, p. 175).

The view of a lack of understanding of the significance of these intermediates is supported by the fact that although Eitschberger carried out some breeding experiments, and was aware of those carried out by the authors cited above, he leaves these data unutilized and unevaluated.

Although his rejection of transitional units is a rejection of the evolutionary process, the case of the relationship between *Pieris napi* and *P. bryoniae* is one of the best examples of the speciation in progress in Lepidoptera.

Eitschberger seems driven to prove the above two taxa are distinct species, a conclusion based chiefly on the argument that two subspecies cannot coexist in one locality. This would surely be an important observation, if all individuals could be clearly distinguished by biological markers as belonging to one or the other species. His categoric rejection of the possible contemporary conspecifity of *napi* and *bryoniae* is not only the rejection that at least some gene flow is in fact possible, it is the rejection of an important adaptive process.

A clear taxonomic synopsis of the *Pieris napi* species-group would have surely enabled biologists without special taxonomic knowledge to carry out field studies that could have contributed to the advancement of our knowledge not only of the pierids concerned, but of their biological and ecological relationships. This unrefereed work produces quite the contrary. It provides the completely unsubstantiated illusion that the vast coterie of named entities have some biological substance. Even more unfortunate is a sort of implied validation of bad science by the sheer volume of information which could mislead the uninitiated.

Conclusions

On its merit, this work is suitable for inclusion in the Official Index of Rejected Works, and we deeply regret that it was ever published, because it brings the sciences of taxonomy and lepidopterology into disrepute.

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